

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of:)
Markku KESKINIVA et al.) Confirmation No.: 3523
Application No.: 10/563,821) Group Art Unit: 3721
Filed: January 6, 2006) Examiner: Lopez, Michelle
FOR: IMPACT DEVICE AND METHOD FOR)
GENERATING STRESS PULSE)
THEREIN)

REPLY BRIEF

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Sir:

I. Claim 1 Sufficiently Defines over the *Ludvigson* Reference

On page 3 of the Examiner's Answer, the Examiner claims that *Ludvigson* discloses a pressure fluid operated impact device having means for generating a stress impulse in the tool by the pressure of a pressure fluid and points to col. 3, lines 12-50, of *Ludvigson*. However, this is false. In contrast, col. 3, lines 12 and 13 of *Ludvigson* read "[w]hen the hammer with its impact cap strikes against the pile....".

Ludvigson discloses a clear striking machine which uses the old commonly known construction of hitting the pile with the hammer. *Ludvigson* does not create a stress pulse just by making a pressure fluid pressure act on the pile and to compress it without a stroke.

At the end of the first paragraph on page 4, the Examiner claims that *Ludvigson* would disclose

"...energy charging means 15 for charging energy of the pressure fluid to be fed to the impact device necessary for generating the stress impulse."

However, this is false. The stress pulse in *Ludvigson* is created by stroke of the hammer at the end of the pile. Energy charging means do not create the stress pulse as claimed in the present invention.

The Examiner further states that the stress pulse is generated "...by pushing the piston against the tool via the control and/or adjustment of the pressure fluid within the working chamber during operation of the device." However, the specification of *Ludvigson* does not describe adjusting of the pressure of the pressure fluid during the impact.

On page 9 of the Examiner's Answer, the Examiner alleges that the claim never points out when generation of the stress pulse occurs, or that the piston remains in contact with the tool

during the driving operation of the tool against the ground. However, the claims, when read as a whole, clearly recite that (1) generation of the stress pulse occurs when the transmission piston is in contact with the tool (either directly or indirectly); and that (2) a force pushes the transmission piston in the direction of the tool, compressing the tool in the longitudinal direction. That is, the transmission piston must be in contact with the tool during stress pulse generation.

Thereafter, Claim 1 defines that "the generation of the stress pulse ending substantially at the same time as the influence of the force on the tool ends...". This clearly defines the end of the creation of the stress pulse. The creation of the stress pulse happens between the start and between the end for the force created by the pressure which means the creation of the stress pulse occurs during the time the pressure fluid forces the tool to be compressed.

"[C]laims... are to be given their broadest reasonable interpretation consistent with the specification, and ... claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. Of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Accordingly, the claims must be read in light of the specification.

As clearly described in the specification and shown in each of Figures 1-4, the end of the transmission piston is in contact with the tool 3 during the stress pulse generation either directly or through a separate connection piece. See paragraph [0020] of the present application. That is, there must be some contact between the transmission piston and tool so that generation of the stress pulse can occur. As further described in paragraph [0020], "[a] sudden stream of pressurized fluid to the working chamber 8 generates a pressure pulse and , as a result, a force affecting the transmission piston 9, pushing the transmission piston 9 towards the tool 3 and thus compressing the tool in its longitudinal direction."

In contrast, the *Ludvigson* reference discloses contact only at the point of impact. The *Ludvigson* reference does not disclose a force “pushing the transmission piston in direction of the tool, compressing the tool in the longitudinal direction”. That is, there has to be more than an instantaneous contact, but rather a contact that allows the force to push the transmission piston, to thereby compress the tool in the longitudinal direction. Such characteristics are not possible in the device described in the *Ludvigson* reference.

At the end of the second paragraph on page 10 the Examiner claims that

"In Ludvigson once the stress pulse (i.e. the impact between the piston and the tool) is being created, a stress pulse (i.e. a pushing force) transmitted to the pile is thus generated by a change and/or adjustment of a fluid pressure behind the piston."

However, the stress pulse to the pile is created by the hit of the hammer at the end of tool and there is no adjustment of the pressure behind the dampening piston 13 of *Ludvigson*. The Examiner also seems to believe that the stress pulse is the same as the pushing force which is incorrect.

In the first paragraph on page 10, the Examiner claims that

"Ludvigson discloses an energy charging means (i.e. valve 23 and accumulator 24) for charging energy of the pressure fluid, from which the pressure having high pressure is periodically allowed to affect the piston and alternately the pressure behind piston is allowed to be released as clearly described in Ludvigson's col. 3, lines 51-61.

However, Applicants respectfully disagree. In contrast, *Ludvigson* describes in col. 3, lines 51-61 how the accumulator can be loaded when starting up the system. This is done only in order to rapidly reach the high pressure level — nothing else. Further, in col. 3, lines 51-61, it is explained, that when the operation is to be terminated (which means when the hammering man takes a lunch break or goes home). The high pressure is released since it is not desirable to leave

the machine for instance to have the high pressure during the whole weekend. Col. 3, lines 51-61, describes in no way increasing pressure and decreasing the pressure for each hammering sequence which means for each hammer hit or stroke. The specification of *Ludvigson* gives not a slightest hint about this kind of operation.

II. Claims 7-11 and 22-26 Define Patentable Subject Matter over Ludvigson in View of Muuttonen

On page 6, second paragraph, the Examiner rejects claims 7-11 and 22-26 as unpatentable of *Ludvigson* in view of *Muuttonen*. The Examiner admits that *Ludvigson* fails to disclose wherein said valve have a plurality of openings in order to feed pressure fluid from the energy charging space. Thereafter, the Examiner claims that

"Muuttonen shows an impact device comprising control means 18 with a valve having a plurality of openings in order to feed pressure from an energy charging space 30 via a plurality of feed channels to a working chamber as shown in fig. 3...."

However, *Muuttonen* discloses damping pistons 18 positioned to receive the recoil from the tool and to keep the shank 15 in the predetermined position so that a striking piston 14 hits the shank 15 properly. Damping pistons 18 are not used and can not be operated to create the stress wave to the tool in any way. The Examiner's statement "for the purpose of providing a force pushing a driving piston in a direction of a tool, generating a stress pulse in the tool" is incorrect. "[T]he driving piston" in *Muuttonen* is the striking piston 14, not dampening pistons 18.

Further, in the second paragraph on page 7, the Examiner states that "Muuttonen also shows a valve 32." However, valve 32 is a normal valve according to the prior art without any

multiple simultaneously open channels. It is commonly known in the field of art that a pressure fluid channel may be divided into two or more parallel channels. *Muuttonen* does not give hint that there would be several channels in the valve itself.

Accordingly, the rejection over the *Ludvigson* and *Muuttonen* references should be reversed.

Respectfully Submitted,

Date: August 19, 2009
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